the range of physical, if not of commercial, practicability. Indeed, there are many fields where wireless telephony already rivals telephony over the metallic circuit, especially now that methods of linking up the two have been perfected, and we look forward with interest to the results of the experiments now being made with the view of establishing a commercial wireless telephone service between London and Birmingham, and the competition which appears likely between cable and wireless telephony from England to Holland.

Obituary.

By the death at Cambridge, on April 9, of Dr. Richard Henry Vernon, at thirty-six years of age, the younger generation of chemists in this country has suffered a serious loss. The elder son of the late Hon. William Vernon, Dr. Vernon was educated abroad and took the degree of Ph.D. at the Zurich Polytechnic. At the close of his course at Zurich the war broke out, and although his health had always been delicate he hastened to offer his services and enlisted as a private, receiving later a commission in the Dorset Regiment. After having been invalided home, he worked for the Chemical Warfare Committee, first at the Imperial College of Science, and afterwards in the University Chemical Laboratory, Cambridge. He was then sent to the Shell Filling Factory at Chittening, where his health became seriously affected. After the armistice he returned to Cambridge, and was appointed to the official position of assistant to the professor of chemistry. Dr. Vernon possessed in a remarkable degree the special sense of the organic chemist, and his manipulative ability was quite exceptional. His work on tellurium, which led to the discovery of the isomeric dimethyltelluronium iodides, had an important bearing on the stereochemistry of elements of higher atomic weight and impressed all who had seen it with his powers. He had a personality of singular charm and attractiveness that rapidly won the friendship of all with whom he was brought into contact.

We notice with much regret the announcement of the death, on April 13, of Mr. Howard Payn in his eighty-first year. In his early life Mr. Payn qualified as a barrister, but never practised. In middle life, after some years' service on a Sugar Commission, he became greatly interested in astronomy, and in 1899 entered Sir Norman Lockyer's laboratory at South Kensington as a volunteer worker. Mr. Payn took part in the eclipse expedition to Santa Pola, Spain, in 1900, and obtained a fine series of photographs of the corona and prominences with a lens of 16-ft. focal length. In 1905 he was with Sir Norman Lockyer's eclipse party at Palma, Majorca, but the spectroscopic photographs which he had planned to take were only partially successful, on account of clouds. In collaboration with Prof. Fowler, he was among the first to investigate the vacuum arc spectra of metallic elements, and to show that enhanced lines are strongly developed under these conditions. Mr. Payn also rendered considerable assistance to Sir Norman Lockyer in his work on "Stone Circles." He died in a nursing home at Hounslow after a long illness, and will be greatly missed by his many friends.

The sudden and unexpected death, from heart failure, of Dr. Herbert Haviland Field, at the age of fifty-two, is a great loss to scientific workers. Some thirty years ago Field, then an American student at Paris, left the path of biological research for the less inviting road of bibliography. His aim was to provide a bibliographic service by cards of standard size. Each card carried numbers according to a modification of the Dewey decimal system, enabling it to be sorted mechanically into place according to the classification desired. Later he became associated with the bibliographic section of *Zoologischer Anzeiger,* and eventually founded at Zurich the well-known Concilium Bibliographicum, which has had the support of the Swiss Government and of various American funds. There he died at his work. It is to be hoped, especially in the present circumstances of the International Catalogue, that the institution he founded will continue and expand.

We much regret to announce the death, on Monday, April 11, at the age of seventy-seven years, of Prof. Arnold William Reinold, F.R.S., lately professor of physics in the Royal Naval College, Greenwich.

We regret to record the death, on April 9, of Mr. Bertram Blount, the well-known chemist, at fifty-four years of age; and, on April 13, of Mr. R. A. Rolfe, of the Royal Botanic Gardens, Kew, at sixty-five years of age.

Notes.

With the intention of saving the lives of numberless birds of bright plumage slaughtered in foreign lands for no better purpose than unnatural decoration, a "Bill to prohibit the importation of the plumage of birds and the sale or possession of plumage illegally imported" has again been introduced in the House of Commons, and on April 13 passed the second reading by a majority of 143 votes against 25. The scope of the Bill is wide. As it stands, it prohibits the importation of all birds' plumes excepting those of African ostriches and eider-ducks, of birds imported alive, of birds ordinarily used in the United

Kingdom as articles of diet, and such plumes as have been imported by a passenger for personal use. A special proviso allows the Board of Trade to grant a licence permitting the importation of plumage "for any natural history or other museum, or for the purpose of scientific research, or for any other special purpose." Opinions in the House of Commons varied as to the probable efficiency of the Bill in its aim of protecting decorative birds. It is obvious that such a decree cannot approach in effectiveness measures of strict protection which might be enforced in the countries which the birds themselves inhabit, nor can it compare with a possible international agreement regulating the use of bird-plumages, but in at least two ways it should make for a reduction of the massacre of birds. In the first place, it should to a very great extent banish the use of imported birds' plumes for decoration in the United Kingdom, and to that extent the actual demand would be reduced. It may also, by dislocating the centre of dispersal in London, permanently disorganise the world-market, and so reduce opportunity for the disposal of skins, and with this the activities of the plume-hunters. In the second place, the moral effect of the final adoption of the Bill would probably be great, and other countries would follow the United Kingdom in endeavouring to protect, without as well as within their own boundaries, "birds attractive in appearance," and perhaps it may be added (as the Nebraskan law adds) "cheerful in song."

THE Corn Sales Bill came up for second reading in the House of Commons on April 14. Its object is to provide for greater uniformity in the weights and measures used in the sale of corn and other crops. At the present time in different districts the quarter of wheat might be 480 lb., 496 lb., 500 lb., 504 lb., or 588 lb. in weight, and even greater variations exist in the case of rye and oats. The Bill provides that all dealings in corn should be made by weight in terms of the hundredweight of 112 imperial standard pounds, the result of this being that the ordinary sack of wheat would be reduced from 18 to 16 stone. Opposition was raised on the grounds that the whole of the futures market in this country is based on the decimal system, and that inconvenience would be caused if all dealings in centals had to be transformed into the 112-lb. measure. It was suggested that the unit of 100 lb. should be substituted for that of 112 lb. proposed in the Bill, but this amendment could not be made until a later stage. The second reading was agreed to without a division.

DR. W. EAGLE CLARKE retired on March 14, under the Civil Service age-limit, from the keepership of the Natural History Department of the Royal Scottish Museum. During his service of thirty-three years he has been mainly responsible for the growth of this museum, and the period of his keepership, to which he was promoted on the retirement of Dr. R. H. Traquair in 1906, has been specially fruitful in the development of the natural history collections as regards both cabinet and exhibited material. Under his supervision the exhibited systematic collections have been entirely rearranged and revised with the view of increasing their æsthetic and educational as well as their scientific value, and many biological groups of birds and mammals have been introduced with great effect. Dr. Eagle Clarke has now been appointed honorary supervisor of the bird collections in the museum. He intends to devote his leisure to the editing of new editions of Saunders's "Manual of British Birds" and Yarrell's "History of British Birds." The vacancy caused by the retirement of Dr. Eagle Clarke has been filled by the promotion of Dr. James Ritchie, who entered the service of the museum, after competitive examination, in 1907.

THE inaugural meeting of the Indian Botanical Society, established "for uniting the botanists and promoting the botanical interests of India," was held under the historic banyan-tree in the Calcutta Botanic Garden at the time of the eighth Indian Science Congress in January last. A booklet has been issued describing the origin of the society, its aims and its provisional constitution, and giving a list of the original members, eighty-one in all. The president for the year is Dr. Winfield Dudgeon, of the Ewing Christian College, Allahabad; the vice-president, Dr. W. Burns, of the College of Agriculture, Poona; and the secretary and treasurer, Mr. Shiv Ram Kashyap, Government College, Lahore. The society does not contemplate any official publication, but members are encouraged to support the *Journal of Indian Botany*. Meetings will be held annually in conjunction with the Indian Science Congress, and the programme for the meeting will be prepared by the executive council in co-operation with the officers of the botany section of the congress. The membership is widely representative of botany and its applications to agriculture and forestry throughout the Empire.

WE learn from the *Pioneer Mail* of March 4 that on February 23 the Viceroy inaugurated the Institution of Engineers (India) in Calcutta. The institution was formed last September as a result of the desire of engineers in India to form a corporate body to safeguard their interests and to provide a means of exchange of views on engineering questions; the institution was open to professional engineers of all nations. In declaring the institution duly inaugurated, the Viceroy emphasised the importance of such a body to a country like India with a growing industrial side, and congratulated the members on the form of their constitution, by which provision was made for the admission of junior members to the council, so that there should be little risk of the council getting out of touch with the aspirations of the younger generation of engineers. The relation of the new institution to the Government of India was also enlarged upon, and its importance as an unofficial advisory body, both as regards industrial questions and with reference to technical education, was discussed.

DURING the interval that has elapsed since the publication of the Report of the Empire Cotton Growing Committee considerable progress has been made towards the establishment of a permanent organisation competent to carry into effect the recommendations contained in the report. The permanent body will be known as the Empire Cotton Growing Corporation, and will be incorporated under Royal charter. Meanwhile, the present Committee has been making careful inquiry from the Governments of the Dominions, Colonies, and Protectorates as to the means by which the development of cotton-growing within the Empire may best be promoted. From more than one of the Governments approached the suggestion has been made that specially qualified men should be appointed to advise the local Agricultural Departments on matters connected with cotton-growing within their respective areas. To assist the proposed corporation the Empire Cotton Growing Committee is prepared to receive now from suitably qualified persons statements of their scientific attainments and/or experience of tropical agriculture, with the view of compiling a register of men whose services overseas may be useful in the development of cotton-growing, either in consultation or by appointment as cotton experts. The register is intended to be available for reference by the corporation now in course of formation, but it is unlikely that appointments can be made for the next few months. All communications, which will be regarded as confidential to the members of the council of the corporation, should be addressed to the Secretary, Empire Cotton Growing Committee, Board of Trade, Great George Street, London, S.W.1.

The Civil Service Commissioners announce that an open competitive examination for not fewer than twenty situations as assistant examiner in the Patent Office, Department of the Board of Trade, will be held in London in July next, commencing on July 12. The limits of age are twenty and twenty-five, with extension for service in H.M. Forces. Regulations and forms of application will be sent in response to requests by letter addressed to the Secretary, Civil Service Commission, Burlington Gardens, London, W.1, on and after April 25.

"The Early Chronology of Sumer and Egypt and Similarities of their Culture" is the subject of a lecture to be delivered by Prof. S. Langdon at the Royal Society's rooms at Burlington House on Wednesday, April 27, at 8.30. The lecture is arranged by the Egypt Exploration Society, and tickets can be obtained gratis on application to the Secretary, 13 Tavistock Square, W.C.1.

Prof. G. H. Parker has been appointed director of the Harvard Zoological Laboratory in succession to Prof. E. L. Mark, who will retire at the close of the academic year after having spent forty-four years in the service of the University. The new director has been a member of the teaching staff at Harvard since his graduation in 1887, and has held a full professorship of zoology since 1906.

The Government has accepted the invitation of the Spanish Government to participate in the third International Fishery Congress, which will be held at Santander on July 31–August 8, and has appointed as its representative Mr. H. G. Maurice, Fisheries Secretary

Don José Rodriguez Carracido, Rector of the University of Madrid, has been elected president of the Spanish Association for the Advancement of Science.

The fourth Silvanus Thompson memorial lecture of the Röntgen Society will be delivered on Thursday, May 19, by Prof. A. V. Hill, of the University of Manchester. The subject will be "Electrical Instruments and Phenomena in Physiology."

In the Journal of the Royal Anthropological Institute (vol. l., January–June, 1920) Prof. A. C. Haddon contributes an elaborate monograph on the outriggers of Indonesian canoes. The present focus of outrigger canoes is the Moluccas, and it is suggested that from Indonesia, if not actually from the Moluccas, migrations took place at various times, each with its special type of canoe or with some partial modification, the earliest types of canoes or outriggers being those that went furthest, while those that started last have a more limited distribution. The paper is well illustrated with woodcuts, and furnished with an ample bibliography of the subject.

Mr. T. Sheppard has republished from the Transactions of the East Riding Antiquarian Society (vol. xxiii., 1920) a paper on the origin of the materials used in the manufacture of prehistoric stone weapons in East Yorkshire. Curiously enough, for a considerable distance in any direction this area does not produce a single rock *in situ* which is suitable for making stone implements. The Yorkshire Chalk, which surrounds Holderness and forms the Wold area, has furnished many thousands of implements, but, though it contains flints, it produces only a form of this material which, owing to its brittle nature, is useless for the purpose. Holderness, on the contrary, a rubbish-heap deposited at the close of the Great Ice age, contains boulders, large and small, derived from Scotland, the Lake District, Teesdale, the coast of Durham and Yorkshire, and even Scandinavia, which supply large quantities of black and pink flints, excellent material available for the ancient flint-workers. Mr. Sheppard's paper, which is supplied with numerous good illustrations, gives full details of this ancient industry.

For the moment smallpox has sunk almost to vanishing point, but this is just the time to read the carefully prepared pamphlet by Dr. Mary Scharlieb on vaccination (Research Defence Society, 1s.). Last year's experience in Scotland shows that smallpox is once more "on the move." During demobilisation thorough inspection of soldiers and civilians stopped many cases at the ports, but now that the Baltic and the Mediterranean are both open the chances of fresh importations have multiplied enormously. Under the new regulations the port sanitary authorities will be better equipped for handling the ordinary infections, including smallpox, at the ports; but the danger of outbreaks, now that the numbers of susceptibles have grown to be a large fraction of the community, will increase as foreign trade increases. Dr. Scharlieb gives an orthodox *résumé* of the historical facts about vaccination, and the whole pamphlet is an appeal to the reason of the anti-vaccinationists. "It would appear," she says, "to be advisable to substitute argument for compulsion." She deals in some detail with the "Leicester experiment." "The Leicester method, as advocated by Dr. Millard, includes vaccinations as general as possible when an outbreak occurs." When Dr. Scharlieb says, "The incubation period of vaccinia is shorter than that of variola, eight or nine days as against twelve," the words imply that these are two distinct diseases. The modern view is that "vaccinia" is simply the effect of inoculating the cow or calf with smallpox virus, and is not any more a separate disease than human tuberculosis inoculated on a cow would be. But the virus, cultivated on the calf through several generations, loses its capacity to produce general infection. As this is a cardinal point in the anti-vaccination argument, the Research Defence Society might well devote a special paper to it. The "portion of the Gloucester cemetery" shown as frontispiece is an eloquent comment on Nature's way with the unvaccinated.

We note with much satisfaction that Major Stanley Flower's efforts to restore the well-nigh exterminated cattle-egret to Egypt have been abundantly rewarded. Mr. J. L. Bonhote, in the Report on the Zoological Service for the Years 1914–18, published in connection with the Giza Zoological Gardens, gives a long and able summary of the steps taken to bring about this much-to-be-desired end. When this apparently hopeless task was begun the bird had been all but exterminated by plume-hunters. Mr. Bonhote is now able to report colonies numbering several thousands, and the birds appear to be still extending their range. In this achievement, made possible by the enlightened action of Lord Kitchener when British Agent and Consul-General, Major Flower has rendered a signal service to Egypt, for the cattle-egret as a destroyer of ticks on cattle and of noxious insects of many kinds has no rival, and therefore the establishment and preservation of large colonies of this bird are of vital importance to the country.

That the woodcock will, on occasion, transport its young by carrying them in mid-air is now a well-established fact. A few other species are said to have been seen performing this feat. Mr. J. H. Gurney in the April issue of *British Birds* writes to say that on May 12, 1920, he found a long-eared owl covering four young ones under a gorse bush. "The situation was somewhat unusual, and so was her subsequent behaviour, for she carried two of her nestlings, in consequence of their being looked at, more than twenty yards and deposited them on a pair of young Scotch firs, where they presented a very comical appearance." It would be interesting to know whether she carried off the remaining nestlings to the trees or transferred the two in the trees back to the nest when the cause of her alarm was removed. In the same communication—"Ornithological Notes from Norfolk for 1920"—Mr. Gurney shows that at least two pairs of bitterns reared young in Norfolk during that year. This, indeed, demonstrates the efficiency of the protection afforded to rare breeding birds in Norfolk.

In an article entitled "Facts about Rattlesnakes," published by the *Los Angeles Times*, and copied by the *Dallas Saturday Night* of June 26, 1920, Mr. W. S. Griswold describes many of the peculiar habits of these snakes. The commensal trait in *Crotalus cerastes* is certainly the most interesting. The horned rattlesnake, the author observes, takes up its abode in the burrow of a prairie-dog, which burrow is also sometimes shared by the small prairie-owl, all these three creatures living amicably together. He explains that the prairie-dogs' holes form the only possible shelter in the arid plains, and that being always near water they make doubly attractive retreats. "In return for this hospitality the rattlesnake," it is remarked, "takes charge of the census, and thoughtfully prevents the prairie-dog from accumulating a larger family than he can conveniently support." According to Dr. Gadow, this instance of commensalism is an exaggeration, the original inhabitants deserting the hole when the rattlesnake intrudes. Mr. Griswold's version is, however, quite credible when one considers the case of the Tuatara lizard, which excavates a hole which it shares with a petrel, and, although invariably tolerant of the petrel and its family, will not allow a second Tuatara to enter.

A correspondent who travels frequently from the south-west of England to London states that, in his opinion, at this time of year vegetation, notably the flowering-trees, is generally more advanced as the metropolis is approached, and he asks whether others have made similar observations. Mr. J. Edmund Clark, who is largely responsible for the phenological reports of the Royal Meteorological Society, has very kindly forwarded us some particulars bearing upon the subject which do not appear to support our correspondent's statement except in the case of the hazel. The following are, for example, the dates of flowering for some trees during 1919 in south-west and south-east England:

	Hazel	Blackthorn	Horse-chestnut	May	Rose
S.W. England ...	Feb. 9	March 31	May 2	May 10	June 6
S.E. ,, ...	,, 3	April 5	,, 7	,, 11	,, 6

Records for 1920 are not yet available. The figures, of course, give no trustworthy indication of the time of flowering of cultivated fruit-trees, which probably constitute the greater part of the flowering trees in the neighbourhood of London.

If segregation of Mendelian factors is determined by the separation of pairs of chromosomes during germ-cell formation, then there should be no Mendelian segregation in parthenogenetic eggs in which the full chromosome complement is retained. Prof. W. E. Agar has adduced further evidence on this point (*Journal of Genetics*, vol. x., No. 4) in a continuation of his breeding experiments with the Cladoceran Daphnia, which reproduces for the most part parthenogenetically. In a cross between *D. obtusa* and *D. pulex*, one of the hybrid offspring was bred parthenogenetically for ten generations. The most conspicuous difference between the species is in the relative lengths of two of the abdominal spines. The F_1 hybrid was intermediate as regards this ratio, and statistical treatment of the measurements of its parthenogenetic offspring failed to show any segregation towards either parent. It is concluded that in such a clone segregation does not take place. The results would be more complete if it were also shown that in sexual reproduction of this hybrid segregation did take place in F_2 or later generations. Such a result would also be interesting as indicating whether the difference between the parent species depends on a single factor or on a larger number of genetic differences. Prof. Agar has shown that each species contains a large number of clones, each of which will perpetuate its differences in parthenogenetic reproduction.

THE 1920 report of the council of the British Research Association for the Woollen and Worsted Industries has just been issued. The chief feature in the report is a fully illustrated description of the research laboratories and workshops at present being fitted up in Leeds. In addition to paying 5400*l*. for the property upon which the central laboratories are being installed, 2000*l*. has been advanced for the purchase of a site for an experimental carding installation in Huddersfield. The director, Major H. J. W. Bliss, is gradually building up staffs for the physics and colloid chemistry, chemistry, engineering, and biology departments, and, although fundamental soundness is not being sacrificed to the too prevalent desire for quick returns, useful researches have already been taken in hand. Thus four publications (Nos. 7, 8, 9, and 10) on important problems have been issued to subscribers, and there are indications of useful work nearing completion on spinning, oils, scouring and milling, and last, but not least, those fundamental problems which no private firm can be expected to undertake. The sheep-breeding experiments, from the wool point of view, in which the association is collaborating with other bodies—notably the Agricultural Departments of England and Scotland—are deemed so important that a special pamphlet has been issued as an appendix to the annual report. Many useful breeding experiments are being made this season—largely under the stimulating influence of Prof. Cossar Ewart, of the University of Edinburgh—and it is hoped from these comparatively small-scale experiments to obtain useful data for others on a much larger scale. It is evident also from this appendix that, in addition to producing new crosses, the association is anxious to improve the present breeds, and in conjunction with the Royal Agricultural Society and other show committees it is about to engage in battle against "grey hair," "kemps," and a deterioration in "wool quality," following mistaken ideas on the relationships of wool and physique.

AN interesting point is made in Water-Paper 418 of the U.S. Geological Survey, on "Mineral Springs of Alaska," where it is remarked that permanent ground-frost surviving in the region from the Glacial epoch has an important influence in diminishing the mineral content of surface-waters. In Seward Peninsula alluvium has been found frozen to depths of more than 200 ft., while on hill slopes facing northward ice occurs within 2 ft. of the surface. Erosion, moreover, is prevented by the general covering of moss, grass, and forest. A. H. Brooks, the author of this section of the paper, indicates a more normal composition for river-waters derived from the mountainous regions, where streams flowing from the snows cut deeply into rock.

THE noble genus Nelumbo is now represented by two species only, the Indian lotus of Asia and northern Australia and the American lotus or great water-lily, found in eastern America from Ontario to 7° S. lat. in Brazil. E. W. Berry (U.S. Geol. Surv., Prof. Paper 108–E) describes a new species from the Eocene of Meridian, Mississippi, resembling some of the European fossil forms, and he gives a world-map showing how the long history of the genus is revealed by its Cretaceous, Cainozoic, and present distribution. The author attributes the southward migration of Nelumbo to the inclemency of the Glacial epoch, and its entire disappearance from the Old World west of the Caspian to the natural obstacles presented by European structure, which prevented its escape southward into Africa.

THE *Meteorological Magazine* for March contains an article by Dr. J. S. Owens on London smoke-fogs. The method adopted by the Atmospheric Pollution Committee for measuring the impurities deposited from the air by large open-topped gauges is acknowledged as insufficient. It has now been supplemented by a method of ascertaining the quantity of suspended matter in the air. An automatic instrument is made to filter a fixed volume of air through a small disc of white filter-paper at short intervals, and a measure is made of the impurities left behind on the filter-paper. Continuous records have been obtained from three stations in different parts of London during the past winter. The records for foggy days are kept separate from days with ordinary weather, and the records for ordinary week-days, excluding Saturdays and Sundays, are kept separate from the results for Saturdays and Sundays respectively. The air is purest between midnight and early morning, and the amount of impurity rapidly increases at about 6 or 7 a.m., reaching its maximum at about 11 a.m. on week-days and at noon on Sundays. A subsidiary maximum is shown at about 5 p.m., after which the impurities rapidly decrease. It is shown, with probably some approximation to truth, that the impurities are due to domestic smoke rather than to industrial furnaces. The author acknowledges that at present the data are scanty, but expresses the hope that further results will prove instructive.

THE discovery by Sir E. Rutherford two years ago that α-particles from radium C on their passage through nitrogen or oxygen produced a small number of particles with range 1·3 times that of the original particles made it possible that the swift particles from thorium C discovered by Rutherford and Wood in 1914 might have been produced by the passage of the α-particles of range 8·6 cm. through the mica screen used in the experiments. In the April issue of the *Philosophical Magazine* Dr. Wood shows that this is not the case, and Sir E. Rutherford describes how he has obtained, by the aid of a powerful source of thorium C presented to him by Dr. H. McCoy, of Chicago, a sufficient number of the long-range particles to determine their bending in a magnetic field. By this means he shows that these swift particles are ordinary α-particles of mass 4, and not doubly charged particles of mass 3, such as are produced by the passage of α-particles through nitrogen and oxygen.

Messrs. Pastorelli and Rapkin, of 46 Hatton Garden, E.C.1, have issued a new list of their glass and metal hydrometers and specific-gravity instruments for use in chemical laboratories and for industrial purposes. The list includes not only all the hydrometers generally used in laboratory and technological determinations, those of Twaddell being particularly well represented, but also an extensive variety of salinometers and saccharometers. It is interesting to see that hydrometers have now a wide application in industry, being no longer confined to brewing and distilling, but required for petrol and other oils; by electricians for accumulators; in the meat-pickling trade; in laundries for testing starch; as "lactometers" for milk; by tanners, who call them "barkometers"; while there is even a special hatter's hydrometer for shellac solutions.

Mr. John Murray is to publish for Lord Haldane a work entitled "The Reign of Relativity," in which the principle of relativity will be dealt with in its philosophical aspect, and not merely as interpreted in mathematical physics. The departments of biology, psychology, the State, and religion will be considered in the investigation, and illustrations of the principle of relativity in this wider application will be drawn from literature, art, religion, and recent physical and natural science. Another book in Mr. Murray's new announcement list is "The Great Malaria Problem and its Solution," by Sir Ronald Ross. The work will be largely an autobiographical record of the inception, progress, and ultimate success of the campaign against malaria.

Mr. R. F. Granger, of Lenton Fields Climatological Station, Nottingham, who made naked-eye observations of the partial eclipse of the sun on April 8, writes to say that he saw Venus clearly, though he could see no stars. He noticed that faint cloud formed at 8.15 and disappeared at 9.0; "it probably lay in the damp layer at the top of the turbulent region, and appeared to be formed by direct cooling." Daisies closed, but chickens took no notice of the darkness.

Erratum.—Nature of April 14, p. 218, 1st col., line 6 from bottom: *For* F. C. Cruikshank *read* F. G. Crookshank.

Our Astronomical Column.

Pons-Winnecke's Comet.—The following provisional elements of Pons-Winnecke's comet have been deduced with the aid of the recent observations.

T 1921 June 13·950 G.M.T., ω 177° 41′ 37″, node 93° 24′ 19″, incl. 19° 11′ 31″, log a 0·51403, e 0·69138, q 1·008.

Ephemeris for Greenwich Midnight.

		R.A.			Decl.		Log r	Log Δ
		h.	m.	s.	°			
April	18	16	12	43	39	36 N.	0·1050	9·6378
	20	16	17	59	40	21	0·0996	9·6213
	22	16	23	32	41	6	0 0942	9·6043
	24	16	29	30	41	53	0·0889	9·5868
	26	16	35	52	42	42	0·0836	9·5696
	28	16	42	38	43	18	0·0783	9·5505
	30	16	50	6	44	0	0·0731	9·5313
May	2	16	58	13	44	39	0·0680	9·5114
	4	17	6	49	45	19	0·0630	9·4911
	6	17	16	26	45	54	0·0580	9·4699
	8	17	26	56	46	28	0·0532	9·4481
	10	17	38	32	46	56	0·0486	9·4253
	12	17	51	25	47	18	0·0440	9·4017

The comet will be nearest the earth (distance 12,500,000 miles) on June 6. The earth passes the node on June 25, about nine days after the comet.

Reid's Comet.—This comet was on the verge of naked-eye visibility more than a week ago. It should be easily so visible when the moon is out of the way. M. Ebell has computed new elements from which the following ephemeris (for Greenwich midnight) is taken. The elements differ only slightly from those given in Nature for March 31. T is May 10·01 and log q 0·00403:

		R.A.			N. Decl.				R.A.			N. Decl.	
		h.	m.	s.	°				h.	m.	s.	°	′
April	22	20	41	54	33	44	May	2	21	16	10	68	24
	24	20	45	20	40	16		4	21	38	8	74	53
	26	20	49	36	47	11		6	22	24	22	80	37
	28	20	55	22	54	20		8	0	31	22	84	49
	30	21	3	32	61	29		10	4	27	37	84	50

Values of log r, log Δ: April 22, 0·0223, 9·8292; April 30, 0·0096, 9·8017; May 8, 0·0042, 9·8640. The high north declination will facilitate observation.

Mr. W. F. Denning writes:—"Reid's comet was faintly visible to the naked eye on the morning of April 16 at 3.20 G.M.T. The comet's perihelion will occur on May 10 next, and when the moon leaves the evening sky about April 24–25 the comet should be easily visible. It will then be situated in Cygnus and a few degrees south of α Cygni. Its motion is carrying it rapidly northwards, so that on May 2 the comet will be found 2° or 3° south-west of β Cephei. It should be readily found with a field-glass, and will probably be easily within reach of the unaided eye."

Fixed Calcium Lines in Early Type Stars.—Since the discovery in 1904 of the fact that the H and K lines of calcium in the star δ Orionis did not share in the large displacements common to all the other lines, a similar effect has been observed in many other stars. A considerable amount of literature has thus accumulated on this subject of "fixed" calcium lines, which has now been collected and discussed by Mr. R. K. Young in a very useful summary published in the Journal of the Royal Astronomical Society of Canada (vol. xiv., p. 389). It appears that nearly all the stars having this peculiar characteristic are of early B type, and this forms a strong argument against the theory that the stationary calcium lines have their origin in a cloud of vapour lying between us and the star. It is also difficult to account for their origin by assuming an extended nebulosity enveloping the star and not partaking in its motion, since in a very close pair of stars observed by Plaskett only one showed this effect; and in the Pleiades, which are known to be surrounded by such a nebula, the effect is not seen at all. The author holds the opinion that the calcium vapour giving rise to the fixed lines forms part of the star's own atmosphere, but is much more extended than the proper reversing layer.